The Pelean type goes a stage further. In it a large proportion of the eruptive magma is blown to fine powder by the expansion of the gases it contains, and thus a mixture is produced of volcanic gases and incandescent dust in which each particle is surrounded and cushioned by an extremely thin layer of gas at a very high temperature, and therefore excessively mobile. The whole mass is therefore endowed with the mobility of a liquid, and under the influence of gravity rolls down slopes on which ordinary solids would lodge. This explanation of the hot blast which destroyed St. Pierre was first advanced by Dr. Flett and the lecturer in 1902, after witnessing an eruption of Mont Pelée, and it has since been generally adopted.[1]

In that year the Wallibu Valley at the foot of the Soufrière, in St. Vincent, was filled by such an incandescent avalanche to a depth of 80 feet, and the Rabaka Valley to a still greater depth. The torrential tropical rains, descending these valleys after the eruption, came in contact with this hot ash and caused various secondary phenomena, such as steam explosions, falls of ash, and gushes of boiling mud, which the lecturer compared with analogous, though somewhat different, phenomena during the late eruption of Vesuvius.

This eruption, as is usual with those of Vesuvius, presented features both of the explosive and effusive types, *i.e.* explosions took place from the central crater, while a great fissure traversed the cone from north to south, and lava was discharged both to the north into the Atrio del Cavallo and also from, chiefly, three or four more *bocce,* or mouths, along the fissure to the south, which descended in the direction of Bosco Reale, Bosco Trecase, and Torre Annunziata.

The chief interest of the eruption of Vesuvius, however, undoubtedly centred round the explosions, the ejecta, and the secondary phenomena in connection with them. The volcano was in unusual activity in April and May, 1905, and had never been absolutely quiet since that time. From April 4 to April 8, 1906, and to a less degree later, a series of explosions took place which enlarged the great central crater to an average diameter of more than a quarter of a mile (as measured by Prof. Loczy), removed the highest central part of the cone, and thus reduced the height of the volcano by about 350 feet, as measured barometrically by the lecturer's party. The resulting débris was distributed in part over the flanks of the cone, while a larger amount of smaller material was carried to the other side of Somma as far as Ottajano and San Giuseppe. In these villages it attained a depth of 3 feet to 4 feet, and broke down the roofs of many houses, and more than one church. In that of Giuseppe, about 250 persons, who had taken refuge, were buried by the débris and met their death. The crater as seen by the lecturer's party on two ascents was oval or heart-shaped, the longer diameter being north and south, the walls sloping somewhat at the top, while lower down they were precipitous, especially towards the south side. At the north side the slopes were somewhat more gentle and the crater wider, while the lip was much lower, and broken down into a sort of plain some yards wide. This section of the crater corresponds exactly with a diagram in a report by the Academy of Sciences of Naples on the eruption of 1737. This eruption seems to have been very similar to that of the present year, and, as in this case, several persons lost their lives at Ottajano. There can be little doubt that the projection of fragmentary material in the direction of Ottajano was in both cases principally due to the shape of the crater when thus, so to speak, re-excavated. A contributing effect was the south-west wind, which blew so strongly as to carry some of the finer material as far as Nola. The wind's effect was to be clearly seen in Naples, where several inches of dust were deposited.

The larger ejected blocks fell chiefly during the earlier part of the eruption on the slopes of the cone and round its foot, where they were mingled, and to a large extent covered up, with much ashes and scoriæ. Here were to be seen the most interesting phenomena of the eruption, viz. the great ash slides. The cone was previously almost smooth and very regular in outline. It consisted of lava streams and dark-coloured ash; in April, 1906, it was thickly covered with whitish ash. This, when it attained a certain thickness, peeled off in veritable avalanches and slid down the mountain. The tracks present a radial appearance, and did so before any rain had fallen. It seems likely that the well-known umbrella-like markings on volcanic cones of tuff (consolidated ash), which have usually been attributed solely to erosion by rain, may in some cases, at any rate, be due to this cause. The avalanches were of sufficient power to carry away the Cook Railway. In one part below the funicular station the rails were bent like wire, and remained for a hundred yards or more along the sides of the avalanche track at right angles to their former position. They were kept together by their fish-plates, but had been entirely stripped of the sleepers. No stratification or particular structure in the materials brought down was noticed. A look out was kept for Lava del Fango (mud lava), which has often caused much damage after Vesuvian eruptions, but there had been no rain to form it before the lecturer's arrival, and comparatively little fell during his visit, so that only very small flows were seen. Prof. Lacroix, however, was fortunate enough to observe a large stream of mud above Ottajano, and he remarked that the resulting breccia was a little harder than the result of the dry avalanches, but presented no particular stratification or other structure by which it could be distinguished from the products of a dry avalanche of the same materials. Consequently no light is thereby thrown on the question whether many tuffs, such, for instance, as those which entomb Pompeii, were deposited, dry or wet.

The lava of this eruption also deserves mention. Flows occurred from the north and south ends of the fissure through the cone above mentioned. That to the north flowed into the Atrio del Cavallo in the early part of the eruption. It was soon covered up with fragmentary ejecta, and at the time of the visit only a few fumaroles remained to mark the course of the fissure. On the south side of the cone three or four *bocce,* or mouths, opened along the fissure, the streams coalesced, and the lava flowed thus for more than half a mile. It then divided into branches, which to a large extent destroyed the villages of Bosco Trecase and Bosco Reale, and nearly reached Torre Annunziata. It crossed and filled up a cutting on the Circumvesuvian Railway.

The discourse concluded with a number of photographs of explosions from the crater taken by the lecturer during his stay of five nights at Cook's Eremo Hotel, near the observatory.

THE ASCENT OF RUWENZORI.

MR. DOUGLAS W. FRESHFIELD gives in the *Times* of September 13 some authentic details of the success of the Duke of the Abruzzi's expedition to Ruwenzori, from a letter received by him from Signor Vittorio Sella, who accompanied the expedition. Signor Sella wrote to Mr. Freshfield under date July 22, from Fort Portal:—

"His Royal Highness, accompanied by two Courmayeur guides, climbed all the five highest snowy peaks of Ruwenzori and took from them observations with a mercurial barometer besides a great many bearings with a prismatic compass. Captain Cagni carefully measured a base-line near Bujongolo in order to ascertain the exact distance between the highest peak of Kiyanja (which he climbed) and the rockshelter Kichuchu. His Royal Highness will therefore be able to publish a really good and complete sketch map of the snowy portion of the chain. Following in his Royal Highness's footsteps I ascended several high peaks and took many photographs and panoramas. I also secured many pictures in the forests and valleys of Mubuku and Bugiogo (the largest tributary of the Mubuku), and some telephotographs of the chain from near Butiti. The weather, however, was very trying to our patience. From June 12 to July 7 we had not a single really fine day.

"His Royal Highness from his barometric observations will soon be able to calculate and give the correct heights of the crowning peaks of Ruwenzori, which are several

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[1] See Anderson and Flett, Phil. Trans., series A, vol. c ., p. 353 *et seq.* (1903); also Anderson, *Geographical Journal,* March, 1903.

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hundred feet higher than Kiyanja and situated north-west of it. They have no connection with the Mubuku Glacier."

Mr. Freshfield finds that a rough sketch plan of the snowy group, sent by Signor Sella, coincides closely with the diagram of Lieut. Behrens, R.E., published in the *Geographical Journal* for July last, and concludes that "there seems little doubt that the highest summits measured by our engineers are identical with the Duke of the Abruzzi's Ruwenzori." Hence the height of the Ruwenzori range may be taken as 16,625 feet.

The chief topographical discovery made by the Italian expedition, apart from its mountaineering successes, seems to be that the northern fork of the Mubuku, called by Signor Sella the Bugiogo, is of hitherto unsuspected importance. Its stream flows round a bend, which conceals its sources from the lower valley. Beyond this lies a basin penetrating far into the heart of the chain, at the head of which, and on the actual watershed, the highest peaks stand.

THE TORONTO MEETING OF THE BRITISH MEDICAL ASSOCIATION.

THE annual meeting of the British Medical Association, held on August 21–25 at Toronto by invitation of the Canadian Branch, under the presidency of Dr. Reeve, the dean of the medical faculty of the university, was a marked success. The city is a fine one, and the university buildings in the Queen's Park are admirably adapted for the work of a congress, combining convenience and beautiful surroundings. About 1600 members and visitors attended, the British contingent numbering 200 or thereabouts. Canadian hospitality was lavish, and we all carry back pleasant memories of our visit to this great country. In addition, good work was done, and the attendance at the numerous sections was well maintained.

A combined meeting of the sections of physiology and pathology discussed the pathology and physiology of the cell nucleus. The discussion was opened by Prof. Adami, of McGill, in a paper giving an excellent survey of the subject. The conclusions formulated were that (1) the nuclear matter conveys and determines, or controls, the inherited peculiarities of the individual, this conveyance being through matter contained in the chromatin loops or chromosomes, while it may be that these individual loops, varying among themselves, determine particular conditions; (2) the nucleus is essential, not merely for the vegetative activities, but also for the higher metabolic activities of the cell and their due coordination; (3) the nucleus is not merely the vegetative centre of the cell, but is involved in its functional activities; (4) the higher syntheses, those associated with growth and those governing specific cellular enzyme actions, are determined and initiated by the nuclear matter; (5) the nucleus is the centre or source of the higher cellular activities, and the nuclear material possesses in itself potentialities superior to those of any ordinary constituent of the cell body; (6) the presence of preformed cytoplasm is essential for the continued existence and growth of the nucleus—each becomes essential for the continued existence of the cell as a whole.

Dr. Ford (Johns Hopkins University) read a paper on an antitoxin for poisonous fungi. He concluded that the toxic agent of the *amonita* was of the nature of a glucoside, and that an antitoxic serum could be prepared with it. It was pointed out in the discussion that this idea was somewhat revolutionary, as hitherto it had been impossible to obtain with glucosides an antitoxic substance.

Several papers were read on cancer. Dr. Clowes (Buffalo) had found that in experimental cancer in mice spontaneous recovery often occurred, and that such animals are immune to further inoculation. This was confirmed by Dr. Bashford (London), who stated that there is no evidence that cancer is on the increase, nor that it is endemic in districts. He had never obtained any transference by mere contact, *i.e.* cancer is not contagious. Prof. Gaylord (Buffalo) detailed some remarkable instances which seemed to show that certain malignant tumours in rats and mice are contagious. As a result of the discussions on cancer, it is noteworthy that the parasitic theory of the origin of cancer seems almost to have been abandoned by pathologists.

Prof. Hewlett and Dr. de Korté (London) read a paper on a beri-beri-like disease occurring in monkeys. The facts observed suggested that beri-beri is an infective disease due to a protozoan parasite, and conveyed by urinary infection. Dr. Ruffer (Egypt) detailed observations on the occurrence of organisms indistinguishable from the cholera vibrio in persons who had not been in contact with cholera.

Prof. Woodhead (Cambridge) stated that he had found opsonins in varying quantity in different milks, facts suggestive of certain lines with regard to treatment.

A combined discussion between the sections of physiology and medicine on over-nutrition and under-nutrition, with special reference to proteid metabolism, was opened by Prof. Chittenden (Yale). As is well known, Prof. Chittenden suggests that half the proteid usually regarded as necessary to support physiological equilibrium is all that is required. Prof. Halliburton (London) did not think that the experiments were conclusive, and suggested that the minimum diet of Prof. Chittenden did not leave any margin for that "reserve force" so necessary to ward off attacks of disease. It might be that in the excess of proteid beyond that required to maintain physiological equilibrium there might be traces of substances which yielded this reserve force. Dr. Robert Hutchison (London) considered that the proteid question could only be solved by cooperation between physiologists and physicians. We wanted to know, not the proteid minimum, but the proteid optimum. There was a danger in sailing too near the wind; we could get along with one lung or one kidney, but two of either organ were preferable. High feeding is responsible for cure in tuberculosis and neurasthenia.

The address in surgery was delivered by Sir Victor Horsley, who took as his subject the technique of operations on the central nervous system. He showed how, by means of Prof. Vernon Harcourt's inhaler, chloroform could be administered in known amount up to 2 per cent., that during some period of the operation the amount of chloroform could be reduced to 0·5 per cent., and that the administration of oxygen stopped venous oozing.

The Senate of Toronto University conferred the honorary degree of LL.D. on, among others, Sir W. Broadbent, Bart., Sir Thomas Barlow, Bart., Sir James Barr, Sir Victor Horsley, Prof. Clifford Allbutt, Prof. Halliburton, Dr. Donald Macalister, and Prof. Aschoff, of Freiburg.

R. T. Hewlett.

A LARCH SAWFLY IN CUMBERLAND.

THE Board of Agriculture and Fisheries recently directed attention in the Press and its journal to the attack of the sawfly (*Nematus erichsoni*, Hartmann) upon larches. So far, serious damage has only been reported to the Board from Cumberland, where the health, if not the life, of an extensive plantation is said to be in danger. This insect is commoner than is supposed, but does not, as a rule, occur in large numbers in this country. There are very few collectors of these insects, hence we are apt to look upon species as rare which really have a wide distribution.

Cameron, in his work on British "Phytophagous Hymenoptera" (vol. ii., p. 51, 1885), only records the insect from an unknown locality. Dale mentions it as occurring at Glanvilles Wootton. It has also been seen on larches near Esher, at Wye, Great Staughton, and Budleigh Salterton. It is widely distributed over Europe, where it is now and then sufficiently abundant to become harmful, especially in Germany. Hagen also records it from the United States.

The adult sawfly has a black thorax, the abdomen red, with the basal seventh and ninth segments black. The legs are dull reddish, with most of the tibiæ white, and the posterior feet and apex of the femora black. In length it is about half an inch. The male has not, apparently, been described.

The larvæ are nearly three-quarters of an inch long when mature, and feed upon the leaves from the *beginning* of July to the end of August. In colour they are shiny grey or dark grey, with the back darker grey except on the second segment. The skin is covered with short, black

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